

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A three-dimensional optical memory medium comprising:

a solid medium forming a base substrate of said optical memory, said solid medium being made of a fluoride glass comprising (a) aluminum fluoride and (b) luminescent ions having a first valence that are trivalent Sm ions; and

a plurality of spots which are three-dimensionally distributed in said solid medium, said spots containing luminescent ions being contained in said spots and having a second valence different from the first valence as a result of that are bivalent Sm ions formed as a result of condensing a pulsed laser beam in said solid medium.

2. (original) A three-dimensional optical memory medium according to claim 1, wherein said spots are different from said solid medium in emission wavelength and/or luminous intensity.

3-7. (cancelled).

8. (original) A three-dimensional optical memory medium according to claim 1, wherein said pulsed laser beam has a wavelength that is different from an absorption wavelength of said solid medium.

9. (original) A three-dimensional optical memory medium according to claim 1, wherein said pulsed laser beam has a peak power density of 10^8 - 10^{17} W/cm².

10. (original) A three-dimensional optical memory medium according to claim 1, wherein said pulsed laser beam has a pulse width not greater than 10^{-10} seconds.

11. (currently amended) A process for producing a three-dimensional optical memory medium, said medium comprising:

a solid medium forming a base substrate of said optical memory, said solid medium being made of a fluoride glass comprising (a) aluminum fluoride and (b) luminescent ions that are trivalent Sm ions; and

a plurality of spots which are three-dimensionally distributed in said solid medium, said spots containing luminescent ions that are bivalent Sm ions formed as a result of condensing a pulsed laser beam in said solid medium, said process comprising:

(a) providing a solid medium comprising luminescent ions ~~having a first valence~~ that are trivalent Sm ions;

(b) condensing a pulsed laser beam to a focal point in said solid medium such that a spot corresponding to said focal point is formed in said solid medium, said spot comprising ~~said luminescent ions having a second valence different from said first valence~~ that are bivalent Sm ions; and

(c) three-dimensionally scanning said solid medium with said pulsed laser beam such that a plural number of ~~said spot~~ spots are formed three-dimensionally in said solid medium, thereby producing said three-dimensional optical memory medium.

12-16. (cancelled).

17. (original) A process according to Claim 11, wherein said pulsed laser beam has a wavelength that is different from an absorption wavelength of said solid medium.

18. (original) A process according to Claim 11, wherein said pulsed laser beam has a peak power density of 10^8 - 10^{17} W/cm².

19. (original) A process according to Claim 11, wherein said pulsed laser beam has a pulse width not greater than 10^{-10} seconds.

20. (currently amended) A process for reading information from a three-dimensional optical memory medium, said medium comprising:

a solid medium forming a base substrate of said optical memory, said solid medium being made of a fluoride glass comprising (a) aluminum fluoride and (b) luminescent ions having a first valence that are trivalent Sm ions; and

a plurality of spots which are three-dimensionally distributed in said solid medium, said spots containing luminescent ions ~~being contained in said spots and having a second valence different from the first valence as a result of that are bivalent Sm ions formed~~ as a result of condensing a pulsed laser beam in said solid medium, said process comprising:

irradiating said three-dimensional optical memory medium with a laser beam having a wavelength such that said luminescent ions contained in said spots are selectively excited and thereby emit light.